

**ABSTRACT**

The present invention is a seismometer/velocimeter, and can be also made to function as an accelerometer. The invention  
5 comprises an in-plane suspension geometry combined with a transverse periodic-sensing-array position transducer. The invention can incorporate a feedback actuator of magnetic design, incorporating fixed magnets and planar coils on the surface of the proof mass allowing for much lower noise than an equivalent  
10 electrostatic actuator without requiring high voltages. The invention may also have a dual-axis configuration by using two sets of springs. The nested suspensions allow the proof mass to move in two orthogonal directions. A three-axis configuration is possible by combining the dual-axis version with sensing and  
15 actuation of the proof mass motion out of the plane. The position sensing for the out-of-plane motion can be made using schemes common in existing state-of-the-art sensors. Actuation for the sensors may be electrostatic or electromagnetic in each of the axis.

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